

and cuprous compounds. Wherever the formation of a molecule out of its constituent atoms leads to a considerable contraction of volume, the molecular magnetism is increased, so that the result may even be a paramagnetic compound. Where, on the other hand, there is expansion, the diamagnetism increases.—Energy of kathode rays, by W. Cady. The author discusses the various methods of determining the energy of kathode rays. The thermopile and the bolometer have undoubted advantages as compared with the calorimeter, but it is necessary to know how much of the energy incident upon them is reflected, and how much energy is lost in the process of reflection. The author bases his calculations upon the supposition that 40 per cent. of the kathode energy is reflected, and that the amount of energy lost during reflection is 30 per cent.—Electric arc between metallic electrodes in nitrogen and hydrogen, by L. Arons. The electromotive forces necessary to produce an arc between metallic electrodes depends upon the nature of the surrounding gas. In air, silver electrodes give a fine arc, but no arc can be produced with them in nitrogen. Iron electrodes, which require a high voltage in air, require only a very low voltage in nitrogen.—Electrolytic records of electric currents, by P. Gruetzner. The author gives details of the method of recording alternating currents of high frequency with the aid of iodine paper, and shows that for low voltages it offers decided advantages over the dust-figure method.—Change of volume of rubidium during fusion, by M. Eckardt. The fusing point of rubidium is $37^{\circ}80'$. During melting, 1 gramme of rubidium expands by 0.01657 c.cm.

Symon's Monthly Meteorological Magazine, May.—Meteorological extremes: wind-force. This is the third of a valuable series of articles; the first two referred to pressure and temperature. The difficulties are far greater than in the other cases, as in determining wind-force observations no homogeneity exists either as regards the instruments employed, or the units of the various scales in which the results, either instrumental or estimated, are expressed. The instrument most generally used is Dr. Robinson's cup-anemometer, the few others being chiefly Osler's or Dine's pressure anemometers. In the velocity instruments the factor for obtaining the true velocity of the wind depends upon the length of the arms and the size of the cups. Until recently the factor used has been 3, but more recent experiments have shown that the speed at the cups should be multiplied by the factor 2.2, so that some very high velocities formerly recorded should be reduced by nearly one-third. Among the highest velocities recorded in this country (reduced by the new factor 2.2), we may mention a severe gale in the Irish Sea in January 1899, in which a rate of 90 miles per hour was recorded in one gust; the maximum mean force for an hour at Fleetwood was 75 miles. The highest recorded velocity in a gust was recorded by Dine's anemometer at Rousdon, in South Devon, in March 1897, viz. at a rate of 101 miles per hour. At Greenwich a pressure of $51\frac{1}{2}$ lbs. on the square foot was recorded on January 18, 1881, which is equivalent to a velocity of about 130 miles per hour, but there is good reason for believing that in strong winds the records of these pressure plate anemometers are occasionally much too high. It is still a moot question, what is the strongest force that the wind attains, and whether the force in some of the gales which visit our exposed shores from the Atlantic is much exceeded in tropical cyclones.

Bollettino della Società Sismologica Italiana, vol. v. 1899-1900, No. 7.—List of earthquakes observed in the East, and especially in the Ottoman Empire, during the year 1896, by G. Agamennone. An extract from a paper noticed in NATURE, vol. lxi. p. 400.—The Etnean earthquake of May 14, 1898, by A. Riccò. The epicentre was at S. Maria di Licodia on the south-west slope of Etna, and the focus must have been shallow, for the shock was strong enough to damage many buildings near the centre of a small disturbed area.—Notices of earthquakes recorded in Italy (October 11–November 19, 1898), by A. Cancani; the most important being earthquakes in Sicily on November 1, 2 and 3, Dalmatia on November 8, the Ionian Sea on November 9, and distant earthquakes on October 12 and November 17.

No. 8.—The Modena-Bologna earthquake of the night of February 1–2, 1900, by G. Agamennone. A slight shock, with a disturbed area of about 60,000 sq. km., but recorded by a seismograph at Lubiana (330 km. from the epicentre).—On an electrothermic phenomenon in electrical contacts with slight pressure, by A. Cancani.—Latian earthquake of July 19, 1899,

by A. Cancani, a paper noticed in NATURE, vol. lxi. p. 573.—Notices of earthquakes recorded in Italy (November 21–December 31, 1898), by A. Cancani, the most important being distant earthquakes on December 1 and 3.—On a new form of multiplication applicable to seismic movements and on a new seismoscope founded on the same, by G. Pericle.

Bulletin de la Société des Naturalistes de Moscou, 1899, No. 1.—Meteorological observations at Moscow in 1898, by E. Leyst.—On the development of green algae under conditions excluding the assimilation of carbon-dioxide, by Dr. A. Artari.—On the *Hedysarum* species (15) found in European Russia, Crimea and Caucasia, by B. Fedtschenko.—On the Hydrachnids of the neighbourhood of Moscow, by A. Croneberg (plate). Forty-nine species, several of which are new, are described.—On the iron-ores (*turjit*) of the South Urals, by J. Samoiloff. All these articles, with the exception of the last one, are in German, or contain German *résumés*.—Notes on Coleoptera of European Russia and Caucasia, by A. Semenov.

Memoirs of the Mathematical Section of the Novorossian (Odessa) Society of Naturalists, vol. xix.—Foundations of a theory of analytical functions, by J. Timtchenko, continued from vols. xii. and xvi. This part contains the history of certain special questions, the discussion of which has mainly contributed to the development of the theory of these functions.

Memoirs of the Kazan Society of Naturalists, vols. xxxii. and xxxiii.—Materials relative to the flora of the northern boundaries of the black-earth region, by S. Griegorieff.—The corals of the Devonian deposits in the Urals, by N. Bojartsen (one plate). Fifty-six species are enumerated, several of these, as also one genus (*Nicholsonia*), being new.—On the saliva glands of *Periplaneta orientalis*, by A. Lebedeff (plate).—The Ranunculaceæ of Russian Turkestan, by Olga and Boris Fedtschenko. One hundred and fifty-eight species are enumerated, forty-three species being endemic, and thirty-eight species belonging to the Alpine region. A suggestion for the determination of the Turkestan species is given. All articles are summed up either in French or in German.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, May 10.—“On Certain Properties of the Alloys of Gold and Copper.” By Prof. Sir W. C. Roberts-Austen, K.C.B., F.R.S., and T. Kirke Rose, D.Sc.

The alloys of gold and copper, which are of great industrial importance owing to their use in coinage, have not been subjected hitherto to systematic examination. It has been assumed that they differ widely from the silver-copper series, which has been studied from different points of view, but there is very little evidence on which this view can be based.

Examination with the aid of a thermo-couple and autographic recorder shows that the freezing-point curve of the gold-copper series consists of two branches setting out from the points of solidification of the pure metals and meeting at a point, which is the freezing point of the eutectic. The eutectic contains about 82 per cent. of gold and 18 per cent. of copper, or about 60 atoms of gold to 40 of copper, and solidifies at 905° . The general shape of the curve therefore resembles that of the silver-copper series when the abscissæ give the relative number of atoms.

Under the microscope, alloys containing more than 82 per cent. of gold show a minutely granular structure in which it is not certain that two constituents can be distinguished. The section of standard gold containing 91.6 per cent. of gold bears a close resemblance to that of standard silver prepared in the same way. The alloy with 80 per cent. of gold shows the characteristically-banded eutectic structure almost exclusively, and the alloys with less gold consist of crystals of copper set in a matrix of the eutectic.

Another point of similarity between the gold-copper and silver-copper series is that both the eutectics are brittle and show scarcely any extensibility; they differ in these respects from most other eutectics. Analysis of various portions of ingots of standard gold reveals the fact that liquation takes place as definitely as in standard silver, the difference in composition between the centre and the outside of similar ingots being, however, three or four times greater in standard silver than in standard gold. In the latter case, the centre contains from 0.3 to 1.0 part per 1000 less gold than the outside.

It follows from these results that the gold-copper series of alloys presents many points of similarity with the silver-copper series, and that the main difference is only one of degree, copper being apparently more soluble in gold in the solid state than in silver.

Geological Society, April 25.—J. J. H. Teall, F.R.S., President, in the chair.—The President read the following resolution which had been passed unanimously by the Council: "That this Council desire to place on record their deep sense of the loss which both science and literature have sustained in the death of the Duke of Argyll, who was the oldest surviving past-President of the Geological Society"; and stated that on behalf of the Council he proposed to communicate a copy of the resolution to the Duchess of Argyll, coupled with an expression of respectful sympathy.—On a complete skeleton of an Anomodont reptile from the Bunter Sandstone of Reichen, near Basel, giving new evidence of the relation of the Anomodontia to the Monotremata, by Prof. H. G. Seeley, F.R.S. The author discusses various views which have been expressed with regard to the position of the Labyrinthodonts. He has already separated these animals from the Amphibia and combined them with the Ichthyosauria in a group of reptiles named Cordylomorpha, and he enumerates a series of characters which constitute so close a link between the two types "that it is not possible, in the absence of evidence, to conceive of their being referred to different classes of animals." In conclusion, the author argues that the points of structure are so few in which Monotreme mammals make a closer approximation to the higher mammals than is seen in the fossil described and other Anomodontia, that the Monotreme resemblances to fossil reptiles become increased in importance. He believes that a group Theropsida might be made to include Monotremata and Anomodontia, the principal differences (other than those of the skull) being that Monotremes preserve the marsupial bones and the atlas vertebra. *Ornithorhynchus* shows pre-frontal and post-frontal bones, and has the malar arch formed as in Anomodonts and some other reptiles.—On Longmyndian Inliers at Old Radnor and Huntley (Gloucestershire), by Dr. Charles Callaway. The grits, with some associated slaty bands, forming a ridge near Old Radnor were considered by Sir Roderick Murchison to be May Hill Sandstone. The author has discovered that one of the beds of Woolhope Limestone, dipping westward, is crowded with rounded and angular fragments of grit bearing a general resemblance to the arenaceous parts of the Old Radnor Group.

May 9.—J. J. H. Teall, F.R.S., President, in the chair.—The Pliocene deposits of the East of England. Part ii: The Crag of Essex (Waltonian), and its relation to that of Suffolk and Norfolk, by F. W. Harmer, with a report on the inorganic constituents of the Crag by Joseph Lomas. Three divisions of the Red Crag are proposed, namely, Waltonian, Newbournian and Butleyan, which are distinguished alike by the difference of their faunas, and by the position which they occupy. The first, with its southern shells, is confined to the county of Essex; the second, containing a smaller proportion of southern and extinct, and a larger proportion of northern and recent species, occupies the district between the Orwell and Deben, and a narrow belt of land to the east of the latter river; the third, in which Arctic forms such as *Cardium groenlandicum* are common, is found only farther north and east. All these beds are believed to have originated in shallow and land-locked bays, successively occupied by the Red Crag sea as it retreated northward, which were silted up, one after the other, with shelly sand. The conditions under which the Red Crag beds originated seem to exist at the present day in Holland, where sandy material brought down by rivers, with dead shells in great abundance from the adjacent sea, is being thrown against and upon the coast, principally by means of the westerly winds now prevalent. From meteorological considerations, it seems probable that strong gales from the east may have prevailed over the Crag area during the latter part of the Pliocene epoch.—A description of the Salt-Lake of Larnaca in the Island of Cyprus, by C. V. Bellamy. After a brief description of the general geology and geography of the island, the author proceeds to deal with the topography of the lake, which occurs in a basin shut off from the sea, its deepest part being about 10 feet below sea-level. The barrier between the salt-lake and the sea is made of stiff calcareous clay associated with masses of conglomerate resting on plastic clay, that on watery mud, and that again on stiff calcareous clay. The sea-water appears to per-

colate through the highest deposits, meeting with checks in the conglomerates, and thus reaches the basin somewhat slowly, where it is evaporated to dryness by the summer heat and deposits its salt. Artificial channels have been made, to carry the flood-water from the land direct to the sea, so that it does not dilute the brine of the lake. The rainfall in the catchment-area round the lake is at the most only enough to supply 223 million gallons, and as the lake contains 480 million gallons when full, the balance of 257 million gallons must be derived from the sea. The lake is probably situated on what was an extensive arm of the sea at the close of the Kainozoic era. The salt-harvest begins in August, at the zenith of summer heat, and it is reported that a single heavy shower at that time of year suffices to ruin it. Observations are given on the density of the water, the plants and animals in the water, and the lake-shore deposits.

Zoological Society, May 8.—Dr. W. T. Blanford, F.R.S., Vice-President, in the chair.—Mr. Sclater exhibited a mounted specimen of a male reedbuck, which had been obtained by Mr. Ewart S. Grogan on the Songwé River, north of Lake Nyasa. The specimen was of about the same size as the common reedbuck (*Cervicapra arundinum*), but differed from that species in several important points. Mr. Sclater considered it referable to a new species, and proposed to name it *Cervicapra thomasinae*.—Mr. C. Davies Sherborn made some remarks on the progress of his "Index Generum et Specierum Animalium," of which he expected the first portion (1751-1800), containing about 60,000 entries, to be ready for publication at the end of this year.—Mr. G. A. Boulenger, F.R.S., read a paper on the batrachians and reptiles collected by Mr. G. L. Bates in the Gaboon (French Congo), among which were specimens of ten new species and five new genera of the former, and of one new species of the latter, which were described. These descriptions were incorporated with a list of the previously known species from the Gaboon, by which it was shown that the batrachians known from this country reached thirty-nine in number and the reptiles eighty.—Mr. W. R. Ogilvie Grant read a paper on the birds of the Hainan, based on a collection sent home by the late Mr. John Whitehead from the Five-Finger Mountains in the interior of the island. Examples of many interesting species had been procured, which were either new to science or to the fauna of the island. Among the former, which numbered eleven, were mentioned a splendid silver pheasant, a remarkable night-heron, and a peculiar brown-and-white jay of the genus *Urocissa*. The paper contained a complete account of the avifauna of Hainan as known at the present time.—Mr. Philip Crowley read a paper on the Rhopalocera collected by the late Mr. John Whitehead on the Five-Finger Mountains in the interior of Hainan. Specimens of 108 species were contained in the collection, of which eight were described as new, and many others were recorded from that island for the first time.—Mr. J. S. Budgett read a paper, entitled "Some points in the anatomy of *Polypterus*," as deduced from an examination of specimens lately procured by the author in the River Gambia.—Mr. G. A. Boulenger gave a list of the fishes collected by Mr. J. S. Budgett during his recent expedition to the Gambia. Among these were examples of two new species, which were proposed to be named *Clarius budgetti* and *Synodontis ocellifer*. Altogether specimens of forty-two species of fishes were obtained by Mr. Budgett from the river.

Mathematical Society, May 10.—Prof. Elliott, F.R.S., Vice-President, in the chair.—The chairman having read the by-laws bearing upon the subject of the special meeting, announced that it was proposed "that by-law iv. 1, be amended by substituting the words 'half-past five o'clock in the afternoon' for 'eight o'clock in the evening.'" The motion having been seconded by Dr. J. Larmor, F.R.S., was carried unanimously.—At the ordinary meeting, Dr. Glaisher, F.R.S., communicated a congruence theorem relating to Eulerian numbers and other coefficients.—Prof. Lamb, F.R.S., spoke briefly on a peculiarity of the wave-system due to the free vibrations of a nucleus in an extended medium.—Prof. Love, F.R.S., gave a description of some diagrams illustrating a paper, by Mr. J. H. Michell, which treats of distributions of stress in two dimensions.—The following papers were communicated by their titles:—The differential equation whose solution is the ratio of two solutions of a linear differential equation, by Mr. M. W. J. Fry; Note on a quinquisectional equation, by Prof. L. J. Rogers; On the differentiation of single theta functions, by the Rev. M. M. U.

Wilkinson; and linear substitutions commutative with a given substitution, by Dr. L. E. Dickson.—Lieut.-Colonel Cunningham, R.E., V.P., showed that numbers which are expressible in the two forms $N = \frac{\mu x^2 + \nu y^2}{\alpha} = \frac{\mu' x'^2 + \nu' y'^2}{\alpha'}$ are always *compossible*, when $\mu\nu = \mu'\nu'$; and showed how to reduce them to the forms $N = X^2 + \mu\nu Y^2 = X'^2 + \mu'\nu' Y'^2$, the factorisation of which is known from Euler's researches.

Royal Meteorological Society, May 17.—Dr. C. Theodore Williams, President, in the chair.—A paper was read on the Wiltshire whirlwind of October 1, 1899, which had been prepared by the late Mr. G. J. Symons, F.R.S., a few days before he was stricken down with paralysis. This whirlwind occurred between 2 p.m. and 3 p.m., commencing near Middle Winterlow and travelling in a north-north-easterly direction. The length of the damage was nearly twenty miles, but the average breadth was only about 100 yards; in this narrow track, however, buildings were blown down, trees were uprooted, and objects were lifted and carried by the wind a considerable distance before they were deposited on the ground. Fortunately the greater part of the district over which the whirlwind passed was open Down, otherwise the damage and perhaps loss of life would have been considerable. At Old Lodge, Salisbury, the lifting power of the whirlwind was strikingly shown by several wooden buildings being lifted up and dropped down several feet north-west of their original position. At a place eighteen miles from its origin the whirlwind came upon a rick of oats, a considerable portion of which it carried right over the village of Ham and deposited in a field more than a mile and a half away.—A paper by Dr. Nils Ekholm, of Stockholm, was also read on the variations of the climate of the geological and historical past and their causes. In this the author attempts to apply the results of physical, astronomical and meteorological research in order to explain the secular changes of climate revealed by geology and history.

DUBLIN.

Royal Dublin Society, February 21.—Prof. G. F. Fitzgerald, F.R.S., in the chair.—Prof. W. N. Hartley, F.R.S., communicated his papers on the action of heat on the absorption spectra and chemical constitution of saline solutions, and on the occurrence of cyanogen compounds in coal-gas, and of the spectrum of cyanogen in that of the oxy-coal-gas flame.—Prof. E. J. McWeeney gave an account of the recently demonstrated connection between mosquitoes and malaria, with a lantern demonstration of the life-history of the former.—Prof. T. Johnson communicated a note on Sclerotium disease of Jerusalem artichoke grown at Greystones, county of Wicklow.

March 21.—Dr. F. T. Trouton, F.R.S., in the chair.—Dr. G. H. Pethebridge read a paper, entitled "Contributions to the knowledge of the action of inorganic salts on the structure and development of plants."—Mr. R. J. Moss (in the absence of Dr. W. E. Adeney) communicated a paper, by Prof. E. A. Lettis and Messrs. Blake, Caldwell and Hawthorne, on the nature and speed of the chemical changes which occur in mixtures of sewage and sea-water.—Prof. J. Joly read a paper on the theory of the order of formation of silicates in igneous rocks, which was illustrated by a diagram (see p. 84).

April 25.—Prof. J. Emerson Reynolds, F.R.S., in the chair.—Prof. J. Emerson Reynolds, F.R.S., read a paper on recent analyses of the Dublin gas supply, and observations thereon.—Prof. G. A. J. Cole communicated a paper by himself and Mr. J. A. Cunningham on certain rocks styled "felstones," occurring as dykes in the county of Donegal.

EDINBURGH.

Royal Society, May 7.—Sir Arthur Mitchell, K.C.B., in the chair.—Mr. John Aitken, F.R.S., read a paper on the dynamics of cyclones and anticyclones, Part ii., which was illustrated by an ingenious experiment showing the production of vortex columns in the air. Over the upper metal surface of a flat box through which steam was blown was spread a sheet of brown paper thoroughly soaked with hot water. A steady gentle blast of air was driven across this steaming surface by means of a rotating fan; and when a barrier was intercepted so as to cut off half of the surface from the direct effect of the blast, a succession of whirls was started at the boundary between the sheltered and unsheltered parts of the surface. These whirls were plainly visible in the columns of rotating cloud, and showed on a small

scale some of the characteristics of cyclones. According to Mr. Aitken's mode of looking at the phenomenon, the blast of air produced by the fan is analogous to the anticyclonic marginal wind which is regarded as driving the cyclone. The relations between the upper and lower currents in a cyclonic movement were also illustrated in the experiment.—Mr. R. C. Punnett communicated a paper on certain Nemertean from Singapore, in which several facts of morphological interest were brought to light, notably the presence, in one species, of ducts placing the anterior portion of the alimentary canal in communication with the excretory system, and so with the exterior; and the different features shown in the termination of the lateral nerve-cords in a single genus where there might be a commissure either above or below the rectum, or else no commissure at all.—Mr. R. T. Omond, in a paper on the reduction to sea-level of the Ben Nevis barometer, pointed out that, using the ordinary reduction formula, we get an appreciable difference between the observed sea-level pressure at Fort William and the reduced Ben Nevis reading. Leaving out of account all cases in which strong winds were blowing, Mr. Omond had worked out in detail the hourly readings for a period of time extending over six years, and gave reasons for his belief that the discrepancy noted above was due to a false estimate of the average temperature of the air between Fort William and Ben Nevis. This average was not the mean of the bottom and top temperatures.

Mathematical Society, May 11.—Mr. Muirhead, President, in the chair.—A theorem in continued fractions (Prof. Steggall), on certain elementary inequality theorems (Prof. Gibson), note sur un problème de géométrie (Mons. Ed. Collignon); communicated by Dr. Mackay.

PARIS

Academy of Sciences, May 14.—M. Maurice Lévy in the chair.—On a zenitho-nadir apparatus designed to measure the zenithal distances of stars near the zenith, by M. A. Cornu. In front of a horizontal telescope carrying a wire micrometer is placed a special arrangement of two mirrors making an angle with each other of 90°. Four images can be seen simultaneously, that of the star near the zenith, the cross wires, the reflection of these wires in the mercury bath, and the image of the wires from the special reflector. When the image of the movable wire coincides with its reflected image from the mercury bath, the nadir-zenithal image of this wire passes through the zenith, whatever may be the deviation from a right angle of the angle between the mirrors. The arrangement possesses important advantages over the methods at present in use.—Remarks on a meteor which fell in Bolivia on November 20, 1899, by the French Chargé d'Affaires at La Paz.—On divergent series, by M. Le Roy.—On the representation of non-uniform functions, by M. L. Desaint.—On a modification which metallic surfaces undergo when submitted to light, by M. H. Buisson. Under the influence of light, the metallic surface changes its state as measured by the rate at which it loses a charge of electricity, this change not being permanent but gradually disappearing when the radiant energy is cut off.—On the thermo-electric properties of some alloys, by M. Émile Steinmann. The alloys studied were ten nickel steels, four samples of platino-iridium, three of aluminium bronze, five telegraphic bronzes, five brasses, and four of German silver, at temperatures ranging from 0° to 260° C. In the binary alloys the observed electromotive forces are arranged in the order of magnitude of one of the components, but no simple relation could be deduced between the electromotive force and chemical composition in the case of nickel steel or of ternary alloys.—Duplex and diplex transmission by electric waves, by M. Albert Turpain.—Experiments in wireless telegraphy from a free balloon, by MM. J. Vallot, J. Lecarme and L. Lecarme. It was found to be possible to transmit messages to the balloon without an earth wire, even up to a distance of six kilometres and a vertical height of 800 metres.—An arrangement designed to prevent the interception of despatches in wireless telegraphy, by M. D. Tommasi.—On the hydrated calcium peroxides, by M. de Forcrand. A thermochemical paper.—On the allotropic transformations of the alloys of iron and nickel, by M. L. Dumas.—Preparation of some aluminium compounds and of the corresponding hydrogen derivatives, by M. Fonzes-Diacon. Details are given of the preparation of aluminium sulphide, selenide, phosphide,

arsenide and antimonide. By the decomposition of these substances the hydrides H_2S , H_2Se , PH_3 and AsH_3 are obtained in a very pure state. SbH_3 can also be prepared in considerable quantity.—The estimation of thallium, by M. V. Thomas. The oxidation of thallous to thallic salts is carried out with bromoauric acid, the precipitated gold being weighed. Provided that the quantity of thallium present is not too small, the results are very exact.—Action of anhydrous aluminium chloride upon acetylene, by M. E. Baud. The aluminium chloride absorbs nearly four times its weight of acetylene, hydrogen, marsh-gas and ethylenic hydrocarbons being evolved. Complicated condensation products are formed, which are being further examined.—Some new organometallic combinations of magnesium and their application to syntheses of alcohols and hydrocarbons, by M. V. Grignard (see p. 85).—Santalenes and santalols, by M. M. Guerbet. A description of the isolation of two alcohols and two hydrocarbons from essence of sandalwood, together with the products resulting from the action of acetic acid, hydrochloric acid, and nitrosyl chloride upon the hydrocarbons and acetic anhydride, and phosphorus pentoxide upon the alcohols.—On tyrosinase, by M. C. Gessard. Tyrosinase is a ferment isolated from fungi, it possessing oxidising powers, giving a red oxidation product with tyrosin.—On the oxidation of erythrite by the sorbose bacterium and production of a new sugar, erythrulose, by M. Gabriel Bertrand (see p. 85).—On the amount of iron in hæmoglobin from the horse, by MM. L. Lapique and H. Gilardoni.—On a method allowing of the extraction of the sugar from molasses by means of the ordinary boiling apparatus, by M. Paul Lecomte.—Chlorophyll assimilation in plants confined in rooms, by M. Ed. Griffon.—A new self-registering apparatus for continuous currents, by MM. Auguste and Louis Lumière.

GOTTINGEN.

Royal Society of Sciences.—The *Nachrichten* (mathematico-physical section), Part iii., for 1899, contains the following memoirs communicated to the Society:—

October 28, 1899.—E. Riecke: Lichtenberg figures in the interior of Röntgen tubes.—W. Voigt: on a problem of Kohlrausch's in thermodynamics.—P. Gordan: new proof of Hilbert's theorem on homogeneous functions.

November 25.—W. Kaufmann: outlines of an electro-dynamical theory of gaseous discharges (Part i.).

December 14.—W. Kaufmann: the same (Part ii.).

December 9.—G. Bohlmann: a problem concerning the "smoothing-out" of statistical curves.

January 13, 1900.—S. Kantor: a theorem in determinants.—A. Schoenflies: a proposition in the analysis of position.—E. Neumann: on Robin's method for determining electrostatic potential.

February 8.—W. Voigt: remarks on the theory of so-called thermomagnetic effects.

February 3.—E. Zermelo: on the motion of a system of points in relation to inequations of condition.

February 17.—A. von Koenen: on the age of North German Wealden formation (*Wälderthon*).

AMSTERDAM.

Royal Academy of Sciences, April 21.—Prof. H. G. Van de Sande Bakhuyzen in the chair.—The following papers were read:—Prof. Kluyver on approximation formulæ concerning the prime numbers, not exceeding a given limit. The author shows that it is possible to express the approximate value of the sum of the $(-s)$ th powers of these prime numbers, if only their total number be given. A similar formula gives an approximation to the value of the logarithm of the least common multiple of all integers below a given number.—Prof. Winkler, on behalf of Mr. M. A. van Melle, on some reflexes in respiration in connection with Laborde's method of re-establishing respiration stopped by narcosis by rhythmically pulling the tongue.—Prof. Franchimont, on behalf of Dr. Greshoff, on Echinopsine, a new crystalline vegetable base. This communication was accompanied by remarks by Prof. Kobert, of Rostock, and Prof. Verschaffelt, of Amsterdam.—Prof. van Bemmelen, on behalf of Dr. F. A. H. Schreinemakers, on the composition of the vapour phase in the system of water and phenol with one and with two liquid phases.—Prof. Bakhuis Roozeboom, (a) on behalf of Dr. A. Smits, on decreases in vapour tension and rises of the boiling point in the case of diluted solutions; (b) on behalf of

Dr. Ernst Cohen, on thermodynamics of Clark's normal element.—All the above papers will be inserted in the *Proceedings*.—The following papers were presented for publication in the *Proceedings*:—(a) One by Prof. Schoute, entitled "Joachimsthal Theorem for Normal Curves"; (b) one by Prof. Bakhuis Roozeboom, on behalf of Dr. Ernst Cohen, entitled "Studies on Inversion (I.)."

DIARY OF SOCIETIES.

THURSDAY, MAY 24.

LINNEAN SOCIETY at 3.—Anniversary Meeting.
INSTITUTION OF ELECTRICAL ENGINEERS, at 8.—Annual General Meeting.

FRIDAY, MAY 25.

ROYAL INSTITUTION, at 9.—The Great Alpine Tunnels: Francis Fox.
PHYSICAL SOCIETY, at 5.—Experiments illustrating the Aberration called Coma: Prof. S. P. Thompson, F.R.S.—Notes on the Measurement of some Standard Resistances: R. T. Glazebrook, F.R.S.—On the Strength of Ductile Materials under Combined Stresses: J. J. Guest.

MONDAY, MAY 28.

SOCIETY OF ARTS, at 4.30.—Imperial Telegraphic Communication: Sir Edward Sassoon.

TUESDAY, MAY 29.

ANTHROPOLOGICAL INSTITUTE, at 8.30.—Early Communications between Italy and Scandinavia: Dr. Oscar Montelius.

WEDNESDAY, MAY 30.

SOCIETY OF ARTS, at 8.—Russian Central Asia; Countries and Peoples: A. R. Colquhoun.

THURSDAY, MAY 31.

ROYAL SOCIETY, at 4.30.—*Probable Papers*: Palæolithic Man in Africa: Sir John Evans, F.R.S.—On the Estimation of the Luminosity of Coloured Surfaces used for Colour Discs: Sir W. de W. Abney, F.R.S.—The Sensitiveness of Silver and of some other Metals to Light: Major-General Waterhouse.—The Crystalline Structure of Metals (Second Paper): Prof. Ewing, F.R.S., and W. Rosenhain.—The Exact Histological Localisation of the Visual Area of the Human Cerebral Cortex: Dr. J. S. Bolton.—Vapour-density of Bromine at High Temperatures (Supplementary Note): Dr. E. P. Perman and G. A. S. Atkinson.

FRIDAY, JUNE 1.

ROYAL INSTITUTION, at 9.—Bunsen: Sir Henry Roscoe, F.R.S.
GEOLOGISTS' ASSOCIATION, at 8.—Our Older Sea Margins: Sir Archibald Geikie, F.R.S.

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